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Art Unit: 1755
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Docket No.: NHL-SCT-21 US
Serial No.: 09/758,903
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In the Claims:

Please cancel claims 1-20, without prejudice.

Please add the following newly-presented claims:

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-21. A flat panel liquid-crystal display, such as for a laptop computer, the flat panel liquid-crystal display comprising one of: a twisted nematic display, a supertwisted nematic display, an active matrix liquid-crystal display, a thin film transistor display, and a plasma addressed liquid-crystal display, said flat panel liquid-crystal display comprising:

backlight apparatus;

a linear polarizer adjacent said apparatus configured to be a backlight;

a first positive uniaxial retardation film adjacent said polarizer;

a first negative retardation film adjacent said first positive uniaxial retardation film;

a first orientation film adjacent said first negative retardation film;

a liquid-crystal layer adjacent said first orientation film;

a second orientation film adjacent said liquid-crystal layer;

a second negative retardation film adjacent said second

orientation film;

a second positive uniaxial retardation film adjacent said second retardation film;

a second linear polarizer adjacent said second positive uniaxial retardation film;

a first glass substrate being disposed between said first orientation film and said first negative retardation film;

a second glass substrate being disposed between said second orientation film and said second negative retardation film;

a first electrode being disposed between said first glass substrate and said first orientation film; and

a second electrode being disposed between said second glass substrates and said second orientation film;

said first and said second glass substrates comprising:

an alkali-free aluminoborosilicate glass;

said glass having a coefficient of thermal expansion $\alpha_{20/300}$ of between $2.8 \times 10^{-6}/K$ and $3.8 \times 10^{-6}/K$;

said glass having the composition (in % by weight, based on oxide):

SiO_2	> 58 - 65
B_2O_3	> 6 - 11.5
Al_2O_3	> 21 - 25
MgO	4 - 8

CaO	0 - 8
SrO	2.6 - < 8
BaO	0 - < 0.5
ZnO	0 - 2;

said glass being configured to be resistant to thermal shock;

said glass being configured to having a high transparency over a broad spectral range in the visible and ultra violet ranges; and

said glass being configured to be free of bubbles, knots, inclusions, streaks, and surface undulations.--

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--22. The flat panel liquid-crystal display according to claim 21, wherein:

said glass comprises at least one of (a.), (b.), (c.), (d.), (e.), and (f.), where (a.), (b.), (c.), (d.), (e.), and (f.) are:

(a.) more than 8% by weight of B_2O_3;

(b.) one of: more than 18% by weight of Al_2O_3, at least 20.5% by weight of Al_2O_3, and at least 21% by weight of Al_2O_3;

(c.) additionally (in % by weight):

ZrO_2	0 - 2
TiO_2	0 - 2
with ZrO_2 + TiO_2	0 - 2

As_2O_3	0 - 1.5
Sb_2O_3	0 - 1.5
SnO_2	0 - 1.5
CeO_2	0 - 1.5
Cl^-	0 - 1.5
F^-	0 - 1.5
SO_4^{2-}	0 - 1.5
with $As_2O_3 + Sb_2O_3 + SnO_2 + CeO_2 + Cl^- + F^- + SO_4^{2-}$	0 - 1.5;

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(d.) a glass in which arsenic oxide, antimony oxide, and inherent impurities are minimized;

(e.) a float glass; and

(f.) one of (i.), (ii.), and (iii.):

(i.) a coefficient of thermal expansion $\alpha_{20/300}$ of between 2.8×10^{-6}/K to 3.6×10^{-6}/K;

(ii.) a glass transition temperature T_g of > 700°C; and

(iii.) a density ρ of < 2.600 g/cm³.--

--23. The flat panel liquid-crystal display according to claim 21, wherein:

said glass comprises (a.), (b.), (c.), (d.), (e.), and (f.), where (a.), (b.), (c.), (d.), (e.), and (f.) are:

(a.) more than 8% by weight of B_2O_3;

(b.) one of: more than 18% by weight of Al_2O_3, at least 20.5% by weight of Al_2O_3, and at least 21% by weight of Al_2O_3;

(c.) additionally (in % by weight):

ZrO_2	0 - 2
TiO_2	0 - 2
with $ZrO_2 + TiO_2$	0 - 2
As_2O_3	0 - 1.5
Sb_2O_3	0 - 1.5
SnO_2	0 - 1.5
CeO_2	0 - 1.5
Cl^-	0 - 1.5
F^-	0 - 1.5
SO_4^{2-}	0 - 1.5
with $As_2O_3 + Sb_2O_3 + SnO_2 + CeO_2 + Cl^- + F^- + SO_4^{2-}$	0 - 1.5;

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(d.) a glass in which arsenic oxide, antimony oxide, and inherent impurities are minimized;

(e.) a float glass; and

(f.) one of (i.), (ii.), and (iii.):

(i.) a coefficient of thermal expansion $\alpha_{20/300}$ of between 2.8×10^{-6}/K to 3.6×10^{-6}/K;

(ii.) a glass transition temperature T_g of > 700°C; and

(iii.) a density ρ of < 2.600 g/cm³.--

--24. A glass substrate for a flat panel liquid-crystal display, such as for a laptop computer, the flat panel liquid-display including a twisted nematic display, a supertwisted nematic display, an active matrix liquid-crystal display, a thin film transistor display, and a plasma addressed liquid-crystal display, said substrate comprising:

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an alkali-free aluminoborosilicate glass;

said glass having a coefficient of thermal expansion $\alpha_{20/300}$ of between 2.8×10^{-6}/K and 3.8×10^{-6}/K;

said glass having the composition (in % by weight, based on oxide):

SiO_2	> 58 - 65
B_2O_3	> 6 - 11.5
Al_2O_3	> 14 - 25
MgO	4 - 8
CaO	0 - < 2
SrO	> 0.5 - < 4
BaO	0 - < 0.5
ZnO	0 - 2;

said glass being configured to be resistant to thermal shock;

said glass being configured to having a high transparency over a broad spectral range in the visible and ultra violet

ranges; and

said glass being configured to be free of bubbles, knots, inclusions, streaks, and surface undulations.--

--25. The glass substrate according to claim 24, wherein:

said glass comprises at least one of (a.), (b.), (c.), (d.), (e.), and (f.), where (a.), (b.), (c.), (d.), (e.), and (f.) are:

(a.) more than 8% by weight of B_2O_3;

(b.) one of: more than 18% by weight of Al_2O_3, at least 20.5% by weight of Al_2O_3, and at least 21% by weight of Al_2O_3;

(c.) additionally (in % by weight):

ZrO_2	0 - 2
TiO_2	0 - 2
with $ZrO_2 + TiO_2$	0 - 2
As_2O_3	0 - 1.5
Sb_2O_3	0 - 1.5
SnO_2	0 - 1.5
CeO_2	0 - 1.5
Cl^-	0 - 1.5
F^-	0 - 1.5
SO_4^{2-}	0 - 1.5
with $As_2O_3 + Sb_2O_3 + SnO_2 + CeO_2$	

$+ Cl^- + F^- + SO_4^{2-}$	0 - 1.5;

(d.) a glass in which arsenic oxide, antimony oxide, and inherent impurities are minimized;

(e.) a float glass; and

(f.) one of (i.), (ii.), and (iii.):

(i.) a coefficient of thermal expansion $\alpha_{20/300}$ of between 2.8×10^{-6}/K to 3.6×10^{-6}/K;

(ii.) a glass transition temperature T_g of > 700°C; and

(iii.) a density ρ of < 2.600 g/cm³.--

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--26. The glass substrate according to claim 24, wherein:

said glass comprises (a.), (b.), (c.), (d.), (e.), and (f.), where (a.), (b.), (c.), (d.), (e.), and (f.) are:

(a.) more than 8% by weight of B_2O_3;

(b.) one of: more than 18% by weight of Al_2O_3, at least 20.5% by weight of Al_2O_3, and at least 21% by weight of Al_2O_3;

(c.) additionally (in % by weight):

ZrO_2	0 - 2
TiO_2	0 - 2
with $ZrO_2 + TiO_2$	0 - 2
As_2O_3	0 - 1.5
Sb_2O_3	0 - 1.5

SnO_2	0 - 1.5
CeO_2	0 - 1.5
Cl^-	0 - 1.5
F^-	0 - 1.5
SO_4^{2-}	0 - 1.5
with $As_2O_3 + Sb_2O_3 + SnO_2 + CeO_2 + Cl^- + F^- + SO_4^{2-}$	0 - 1.5;

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(d.) a glass in which arsenic oxide, antimony oxide, and inherent impurities are minimized;

(e.) a float glass; and

(f.) one of (i.), (ii.), and (iii.):

(i.) a coefficient of thermal expansion $\alpha_{20/300}$ of between $2.8 \times 10^{-6}/K$ to $3.6 \times 10^{-6}/K$;

(ii.) a glass transition temperature T_g of > 700°C; and

(iii.) a density ρ of < 2.600 g/cm³.--

--27. A glass comprising:

a substantially alkali-free aluminoborosilicate glass;

said glass having a coefficient of thermal expansion $\alpha_{20/300}$ of between $2.8 \times 10^{-6}/K$ and $3.8 \times 10^{-6}/K$;

said glass having the composition (in % by weight, based on oxide):

SiO_2	> 58 - 65

B_2O_3	> 6 - 11.5
Al_2O_3	> 14 - 25
MgO	4 - 8
CaO	0 - 8
SrO	2.6 - < 4
BaO	0 - < 0.5
with SrO + BaO	> 3
ZnO	0 - 2.--

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--28. The glass according to claim 27, wherein:

said glass is configured to be resistant to thermal shock;

said glass is configured to having a high transparency over a broad spectral range in the visible and ultra violet ranges; and

said glass is configured to be free of bubbles, knots, inclusions, streaks, and surface undulations.--

--29. The glass according to claim 28, wherein:

said glass comprises more than 8% by weight of B_2O_3.--

--30. The glass according to claim 29, wherein:

said glass comprises one of (i.) and (ii.):

(i.) more than 18% by weight of Al_2O_3; and

(ii.) at least 20.5% by weight of Al_2O_3.--

--31. The glass according to claim 30, wherein said glass comprises at least 21.5% by weight of Al_2O_3.--

--32. The glass according to claim 31, wherein:

said glass additionally comprises (in % by weight):

ZrO_2	0 - 2
TiO_2	0 - 2
with $ZrO_2 + TiO_2$	0 - 2
As_2O_3	0 - 1.5
Sb_2O_3	0 - 1.5
SnO_2	0 - 1.5
CeO_2	0 - 1.5
Cl^-	0 - 1.5
F^-	0 - 1.5
SO_4^{2-}	0 - 1.5; and
with $As_2O_3 + Sb_2O_3 + SnO_2 + CeO_2 + Cl^- + F^- + SO_4^{2-}$	0 - 1.5.--

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--33. The glass according to claim 32, wherein:

said glass comprises a glass in which arsenic oxide, antimony oxide, and inherent impurities are minimized.--

--34. The glass according to claim 33, wherein: said glass comprises a float glass.--

--35. The glass according to claim 34, wherein: said glass has one of (i.), (ii.), and (iii.):

(i.) a coefficient of thermal expansion $\alpha_{20/300}$ of between 2.8 x 10^{-6}/K to 3.6 x 10^{-6}/K;

(ii.) a glass transition temperature T_g of > 700°C; and

(iii.) a density ρ of < 2.600 g/cm^3.--

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--36. The glass according to claim 27, wherein: said glass comprises at least one of (a.), (b.), (c.), (d.), (e.), and (f.), where (a.), (b.), (c.), (d.), (e.), and (f.) are:

(a.) more than 8% by weight of B_2O_3;

(b.) one of: more than 18% by weight of Al_2O_3, at least 20.5% by weight of Al_2O_3, and at least 21% by weight of Al_2O_3;

(c.) additionally (in % by weight):

ZrO_2	0 - 2
TiO_2	0 - 2
with ZrO_2 + TiO_2	0 - 2
As_2O_3	0 - 1.5
Sb_2O_3	0 - 1.5
SnO_2	0 - 1.5

CeO_2	0 - 1.5
Cl^-	0 - 1.5
F^-	0 - 1.5
SO_4^{2-}	0 - 1.5
with $As_2O_3 + Sb_2O_3 + SnO_2 + CeO_2 + Cl^- + F^- + SO_4^{2-}$	0 - 1.5;

(d.) a glass in which arsenic oxide, antimony oxide, and inherent impurities are minimized;

(e.) a float glass; and

(f.) one of (i.), (ii.), and (iii.):

(i.) a coefficient of thermal expansion $\alpha_{20/300}$ of between 2.8×10^{-6}/K to 3.6×10^{-6}/K;

(ii.) a glass transition temperature T_g of > 700°C; and

(iii.) a density ρ of < 2.600 g/cm³.--

--37. The glass according to claim 27, wherein:

said glass is configured as a glass substrate in combination in or with a flat panel liquid-crystal display, such as for a laptop computer, the flat panel liquid-crystal display including a twisted nematic display, a supertwisted nematic display, an active matrix liquid-crystal display, a thin film transistor display, and a plasma addressed liquid-crystal display.--

--38. The glass according to claim 37, wherein:

said flat panel liquid-crystal display comprises:

backlight apparatus;

a linear polarizer adjacent said apparatus configured to be a backlight;

a first positive uniaxial retardation film adjacent said polarizer;

a first negative retardation film adjacent said film;

a first orientation film adjacent said retardation film;

a liquid-crystal layer adjacent said first orientation film;

a second orientation film adjacent said liquid-crystal layer;

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a second negative retardation film adjacent said second orientation film;

a second positive uniaxial retardation film adjacent said second retardation film;

a second linear polarizer adjacent said second retardation film;

a first glass substrate being disposed between said first orientation film and said first negative retardation film;

a second glass substrate being disposed between said second orientation film and said second negative retardation film;

a first electrode being disposed between said first glass

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substrate and said first orientation film; and

a second electrode being disposed between said second glass substrates and said second orientation film.--

--39. The glass according to claim 27, wherein:

said glass is configured as a glass substrate in combination in or with a thin-film photovoltaic device, including a thin-film solar cell.--

--40. The glass according to claim 39, wherein,

said thin-film photovoltaic device comprises:

said glass substrate;

a transparent conductive oxide film disposed on said substrate;

an insulating buffer layer disposed atop said transparent conductive oxide film;

said film being disposed between said glass substrate and said buffer layer and being configured to be a front contact current collector;

a first semiconductor layer disposed upon said buffer layer;

a second semiconductor layer disposed upon said first semiconductor layer to form a heterojunction;

a first electrical contact disposed upon said second